

Name:
Roll No:



UPES

End Sem Examination, April/May-2024

Programme Name: B.Tech APE UP
Course Name: Advanced Drilling Engineering
Course Code: PEAU 2015

Semester: IV
Time: 03 hrs
Max. Marks: 100

Instructions:

- All questions are compulsory.
- However, internal choice has been provided. You have to attempt only one of the alternatives in all such questions.

SECTION A (5Qx4M=20Marks)

S. No.		Marks	CO
Q1	Define KOP, inclination angle and azimuth angle.	04	CO1
Q2	Define normal, abnormal & sub-normal pressures considered during well Control.	04	CO1
Q3	List the main components involved in Pozmix cement.	04	CO2
Q4	Distinguish between MWD & LWD.	04	CO2
Q5	Discuss the advantages of Rotary steerable system over mud motor systems.	04	CO2

SECTION B (4Qx10M=40 Marks)

Q 6	List out the different deflection tools used in directional drilling. Explain whipstock tool types with their advantages and disadvantages.	10	CO2
Q 7	A production casing was running to a depth of 12,000 ft. When the casing was at bottom, the inside casing was partially full of water up to a depth of 6,500 ft. Later, the inside of the casing was filled with water up to the surface. If the mud weight in annulus is 14.5 ppg, calculate the collapse pressure at the casing shoe for both cases?	10	CO3
Q 8	Explain the types of BOP in detail. OR Discuss the types of well completion methods in detail.	10	CO3

Q 9	Differentiate between single stage cementing operation and multi-stage cementing operation.	10	CO4
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SECTION-C
(2Qx20M=40 Marks)

Q 10	<p>In an oil and gas project while designing a deviated well, it has been decided to sidetrack a well from 1500 ft. The sidetrack will be a build and hold profile with the following specifications:</p> <table border="1" style="margin-left: auto; margin-right: auto;"> <tr> <td>Target Depth</td> <td>: 10000 ft.</td> </tr> <tr> <td>Horizontal departure</td> <td>: 3500 ft.</td> </tr> <tr> <td>Build up Rate</td> <td>: 1.5° per 100 ft.</td> </tr> </table> <p>Calculate the following:</p> <ol style="list-style-type: none"> the drift angle of the well. the TVD and horizontal deviation at the end of the buildup section. the total measured depth to the target <p style="text-align: center;">OR</p> <p>Discuss the properties of class G & H cement and also discuss the cement additives. Analyse the role of accelerators and retarders in cement slurry additives.</p>	Target Depth	: 10000 ft.	Horizontal departure	: 3500 ft.	Build up Rate	: 1.5° per 100 ft.	20	CO4
Target Depth	: 10000 ft.								
Horizontal departure	: 3500 ft.								
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Q 11	<p>The 9 5/8" casing of a well is to be cemented in place with a single stage cementing operation. The appropriate calculations are to be conducted prior to the operation. The details of the operation are as follows:</p> <p>9 5/8" casing is set at : 13,800 ft 12 1/4" hole : 13,810 ft 13 3/8" 68 lbm/ft casing is set : 6,200 ft TOC (top of cement) outside 9 5/8" casing : 3,000 ft above shoe Slurry density: 15.9 ppg Assume gauge hole, add 20% excess in open hole The casing is to be cemented with class G cement with the following Additives: 0.2% D13R (retarder) 1.0% D65 (friction reducer)</p> <p>Volumetric capacity of 9 5/8" casing and 12 1/4" hole: 0 3132 ft³/ft Volumetric capacity of 9 5/8" casing and float collar: 0.5050 ft³/ft Volumetric capacity of 12 1/4" hole: 0 8185 ft³/ft Yield of Class G cement for density of 15.9 ppg: 1.14 ft³/sk. Mixwater requirements: 5 gal/sk</p>	20	CO5
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